

A049 US

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner

Unassigned

Group Art Unit:

1642

:

Applicant

Jurg Tschopp

Serial No.

09/520,489

Filing Date

March 8, 2000

For

APRIL- A NOVEL PROTEIN WITH GROWTH

EFFECTS

New York, New York July 19, 2000

Hon. Assistant Commissioner for Patents Washington, D.C. 20231

# TRANSMITTAL LETTER FOR INFORMATION DISCLOSURE STATEMENT

Sir:

Transmitted herewith is an Information Disclosure Statement in the above-identified application. This Statement is submitted:

- [ ] within three months of the application filing date;
- [X] more than three months from the application filing date but before the mailing date of the first Office Action on the merits.

In accordance with 37 C.F.R. § 1.97, submission of this Statement requires no fee. However, if for any reason a fee is due, the Commissioner is hereby authorized to



charge payment of any fees required in connection with this JUL 252000 Information Disclosure Statement to Deposit Account

No. 06-1075. A duplicate copy of this letter is transmitted herewith.

Respectfully submitted,

James F. Haley Jr. (Registration No. 27,794)

Attorney for Applicant

Jonathan M. Kaplan (Registration No. P-46,819)

Agent for Applicant c/o FISH & NEAVE

1251 Avenue of the Americas New York, New York 10020-1104

Tel.: (212) 596-9000

I Hereby Certify that the Correspondence is being Deposited with the U.S. Postal Service as Pirst Class Mail in an Envelope Compressioner For Parents.

MASHINGTON, D.C. 20231 on

Signature of Person Si



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner

: Unassigned

Group Art Unit:

1642

Applicant

Jurg Tschopp

Serial No.

: 09/520,489

Filing Date

: March 8, 2000

For

APRIL- A NOVEL PROTEIN WITH GROWTH

EFFECTS

New York, New York July 19, 2000

Hon. Assistant Commissioner for Patents
Washington, D.C. 20231

:

#### INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. §§ 1.56 and 1.97, applicant hereby makes the following references of record in the above-identified patent application:

#### U.S. PATENT DOCUMENTS

5,176,996	1/5/93	Hogan et al.
5,264,564	11/23/93	Matteucci
5,256,775	10/26/93	Froehler
4,816,567	3/28/89	Cabilly et al.

#### FOREIGN PATENT DOCUMENTS

WO	99/50416	10/7/99	PCT	C12N	15/19
WO	97/33902	9/18/97	PCT	С07Н	21/02

#### OTHER DOCUMENTS

Smith et al., 1993, CD30 Antigen, A Marker For Hodgkin's Lymphoma, Is A Receptor Whose Ligand Defines An Emerging Family Of Cytokines With Homology To TNF, Cell, 73:1349-1360

Smith, 1994, Virus Strategies For Evasion Of The Host Response To Infection, Trends In Microbiology, 2:81-88

Smith et al., 1990, A Receptor For Tumor Necrosis Factor Defines An Unusual Family Of Cellular And Viral Proteins, Science, 248:1019-1023

Kohno et al., 1990, A Second Tumor Necrosis Factor Receptor Gene Product Can Shed A Naturally Occurring Tumor Necrosis Factor Inhibitor, PNAS, 87:8331-8335

Loetscher et al., 1990, Molecular Cloning And Expression Of The Human 55kd Tumor Necrosis Factor Receptor, Cell, 61:351-359

Schall et al., 1990, Molecular Cloning And Expression Of A Receptor For Human Tumor Necrosis Factor, Cell, 61:361-370

Jones et al., 1989, Structure Of Tumor Necrosis Factor, Nature, 338:225-228

Eck et al., 1989, The Structure Of Tumor Necrosis Factor-Alpha at 2.6 Å Resolution, J. Biol. Chem., 264:17595-17605

Funakoshi et al., 1994, Inhibition Of Human B-Cell Lymphoma Growth By CD40 Stimulation, Blood, 83:2787-2794

Brojatsch et al., 1996, CAR1, a TNFR-Related Protein, Is A Cellular Receptor For Cytopathic Avian Leukosis-Sarcoma Viruses And Mediates Apoptosis, Cell, 87:845-855

Montgomery et al., 1996, Herpes Simplex Virus-1 Entry Into Cells Mediated By A Novel Member Of The TNF/NGF Receptor Family, Cell, 87:427-436

Nagata, 1997, Apoptosis By Death Factor, Cell, 88:355-365

Sytwu et al., 1996, The Roles of Fas/APO-1 (CD95) And TNF In Antigen-Induced Programmed Cell Death In T Cell Receptor Transgenic Mice, Immunity, 5:17-30

Zheng et al., 1995, Induction Of Apoptosis In Mature T Cells By Tumour Necrosis Factor, Nature, 377:348-351

Lee et al., 1996, T Cell Receptor-Dependent Cell Death Of T Cell Hybridomas Mediated By The CD30 Cytoplasmic Domain In Association With Tumor Necrosis Factor Receptor-Associated Factors, J. Exp. Med., 183:669-674

Amakawa et al., 1996, Impaired Negative Selection Of T Cells In Hodgkin's Disease Antigen CD30-Deficient Mice, Cell, 84:551-562

Vassalli, 1992, The Pathophysiology Of Tumor Necrosis Factors, Ann. Rev. Immunol., 10:411-452

van der Krol et al., 1988, Modulation Of Eukaryotic Gene Expression By Complementary RNA or DNA Sequences, Biotechniques, 6:958-976

Tracey, K., 1992, in <u>Tumor Necrosis Factors</u>. <u>The Molecules And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 255-273

Waage, A., 1992, in <u>Tumor Necrosis Factors</u>. <u>The Molecules</u> <u>And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 275-283

Roodman, G.D., 1992, in <u>Tumor Necrosis Factors. The Molecules And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 117-129

Nakane, A., 1992, in <u>Tumor Necrosis Factors</u>. <u>The Molecules And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 285-292

- Clark, I.A. et al., 1992, in <u>Tumor Necrosis Factors</u>. The <u>Molecules And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 303-328
- Grau, G.E. et al., 1992, in <u>Tumor Necrosis Factors. The Molecules And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 329-340
- Piguet, P.F., 1992, in <u>Tumor Necrosis Factors. The</u>
  <u>Molecules And Their Emerging Role In Medicine</u>, B. Beutler
  (ed), Raven Press, NY, p. 341-354
- Wong, G.H.W. et al., 1992, in <u>Tumor Necrosis Factors. The Molecules And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 371-381
- Malik, S.T.A., 1992, in <u>Tumor Necrosis Factors. The</u>
  <u>Molecules And Their Emerging Role In Medicine</u>, B. Beutler
  (ed), Raven Press, NY, p. 407-423
- Fox, D.A., 1995, Biological Therapies: A Novel Approach To The Treatment Of Autoimmune Disease, Am. J. Med., 99:82-88
- Goeddel, D. et al., 1986, Tumor Necrosis Factors: Gene Structure And Biological Activities, Cold Spring Harbor Symposium Quant. Biol., 51:597-609
- Trinchieri, G., in <u>Tumor Necrosis Factors</u>. <u>The Molecules</u> <u>And Their Emerging Role In Medicine</u>, B. Beutler (ed), Raven Press, NY, p. 515-530
- Tartaglia, L.A. et al., 1991, The Two Different Receptors For Tumor Necrosis Factor Mediate Distinct Cellular Responses, Proc. Natl. Acad. Sci. USA, 88:9292-9296
- Tartaglia, L.A. and Goeddel, D.V., 1992, Two TNF Receptors, Immunol. Today, 13:151-153
- Kriegler, M. et al., 1988, A Novel Form Of TNF/Cachectin Is A Cell Surface Cytotoxic Transmembrane Protein: Ramifications For The Complex Physiology of TNF, Cell, 53:45-53
- Luettig, B. et al., 1989, Evidence For The Existence Of Two Forms Of Membrane Tumor Necrosis Factor: An Integral Protein And A Molecule Attached To Its Receptor, J. Immunol., 143:4034-4038
- Ware, C.F. et al., 1995, in <u>Pathways For Cytolysis</u>, G.M. Griffiths and J. Tschopp (Eds.), Springer-Verlag, Berlin, Heidelberg, p. 175-218

Paul, N.L. and Ruddle N.H., 1988, Lymphotoxin, Ann. Rev. Immunol., 6:407-438

Crowe, P.D. et al., 1994, A Lymphotoxin-Beta-Specific Receptor, Science, 264:707-710

Browning, J.L. et al., 1993, Lymphotoxin Beta, A Novel Member Of The TNF Family That Forms A Heteromeric Complex With Lymphotoxin On The Cell Surface, Cell, 72:847-856

Browning, J.L. et al., 1995, Characterization Of Surface Lymphotoxin Forms, J. Immunol., 154:33-46

De Togni, P. et al., 1994, Abnormal Development Of Peripheral Lymphoid Organs In Mice Deficient In Lymphotoxin, Science, 264:703-707

Shanafelt M-C, et al., 1995, J. Immunol., 154:1683-1690

Browning, J. and Ribolini, A., 1989, Studies On The Differing Effects Of Tumor Necrosis Factor And Lymphotoxin On The Growth Of Several Human Tumor Lines, J. Immunol., 143:1859-1867

Browning, J. et al., 1996, Signaling Through The Lymphotoxin Beta Receptor Induces The Death Of Some Adenocarcinoma Tumor Lines, J. Exp. Med., 183:867-878

Suda, T. et al., 1995, Expression Of The Fas Ligand In Cells Of T Cell Lineage, J. Immunol., 154:3806-3813

Trauth, B.C. et al., 1989, Monoclonal Antibody-Mediated Tumor Regression By Induction Of Apoptosis, Science, 245:301-305

Yonehara, S. et al., 1989, A Cell-Killing Monoclonal Antibody (Anti-Fas) To A Cell Surface Antigen Co-Downregulated With The Receptor Of Tumor Necrosis Factor, J. Exp. Med, 169:1747-1756

Nagata, S. and Golstein, P., 1995, The Fas Death Factor, Science, 267:1449-1456

Falk, M.H. et al., 1992, Expression Of The APO-1 Antigen In Burkitt Lymphoma Cell Lines Correlates With A Shift Towards A Lymphoblastoid Phenotype, Blood, 79:3300-3306

Rieux-Laucat, F. et al., 1995, Mutations In Fas Associated With Human Lymphoproliferative Syndrome And Autoimmunity, Science, 268:1347-1349

Takahashi, T. et al., 1994, Generalized Lymphoproliferative Disease In Mice, Caused By A Point Mutation In The Fas Ligand, Cell, 76:969-976

Watanabe-Funkunaga, R. et al., 1992, Lymphoproliferation Disorder in Mice Explained by Defects in Fas Antigen That Mediates Apoptosis, Nature, 356:314-317

Galle, P.R. et al., 1995, Involvement Of The CD95 (APO-1/Fas) Receptor And Ligand In Liver Damage, J. Exp. Med., 182:1223-1230

Silvestris, F. et al., 1995, Autoreactivity In HIV-1 Infection: The Role Of Molecular Mimicry, Clin. Immunol. Immunopathol., 75:197-205

Katsikis, P.D. et al., 1995, Fas Antigen Stimulation Induces Marked Apoptosis of T Lymphocytes In Human Immunodeficiency Virus-Infected Individuals, J. Exp. Med., 181:2029-2036

Badley, A.D. et al., 1996, Upregulation Of Fas Ligand Expression By Human Immunodeficiency Virus In Human Macrophages Mediates Apoptosis Of Uninfected T Lymphocytes, J. Virol., 70:199-206

Wiley, S.R. et al., 1995, Identification And Characterization Of A New Member Of The TNF Family That Induces Apoptosis, Immunity, 3:673-682

Gauchat, J.F. et al., 1993, Human CD40-Ligand: Molecular Cloning, Cellular Distribution And Regulation Of Expression By Factors Controlling IgE Production, FEBS Lett., 315:259-266

Funakoshi, S. et al., 1994, Inhibition Of Human B-Cell Lymphoma Growth By CD40 Stimulation, Blood, 83:2787-2794

Allen, R.C. et al., 1993, CD40 Ligand Gene Defects Responsible For X-Linked Hyper-IgM Syndrome, Science, 259:990-993

Biancone, L. et al., 1995, Inhibition Of The CD40-CD40 Ligand Pathway Prevents Murine Membranous Glomerulonephritis, Kidney Int., 48:458-468

Mohan, C. et al., 1995, Interaction Between CD40 And Its Ligand gp39 In The Development Of Murine Lupus Nephritis, J. Immunol., 154:1470-1480

Ruby, J. et al., 1995, CD40 Ligand Has Potent Antiviral Activity, Nature Medicine, 1:437-441

Wang, Z. et al., 1995, Induction Of bcl-x by CD40 Engagement Rescues sIg-Induced Apoptosis In Murine B Cells, J. Immunol., 155:3722-3725

Cleary, A.M., et al., 1995, J. Immunol., 155:3329

Hess, S. and Engelmann, H., 1996, A Novel Function Of CD40: Induction Of Cell Death In Transformed Cells, J. Exp. Med., 183:159-167

Goodwin, R.G., et al., 1993, Molecular And Biological Characterization Of A Ligand For CD27 Defines A New Family Of Cytokines With Homology To Tumor Necrosis Factor, Cell, 73:447-456

Goodwin R.G. et al., 1993, Molecular Cloning Of A Ligand For The Inducible T Cell Gene 4-1BB: a Member Of An Emerging Family Of Cytokines With Homology To Tumor Necrosis Factor, Eur. J. Immunol., 23:2631-2641

Stein C.A. et al., 1988, Oligodeoxynucleotides As Inhibitors Of Gene Expression: A Review, Cancer Res, 48:2659-2668

Winter G. and Milstein C., 1991, Man-Made Antibodies, Nature, 349:293-299

Arulanandam A.R.N. et al., 1993, A Soluble Multimeric Recombinant CD2 Protein Identifies CD48 As A Low Affinity Ligand For Human CD2: Divergence Of CD2 Ligands During The Evolution Of Humans And Mice, J. Exp. Med., 177:1439-1450

Queen et al., 1989, A Humanized Antibody That Binds To The Interleukin 2 Receptor, Proc Natl. Acad Sci., 86:10029-10033

Leung D.W., et al., 1989, A Method For Random Mutagenesis Of A Defined DNA Segment Using A Modified Polymerase Chain Reaction, Technique, 1:11-15

Narang, S.A., 1983, DNA Synthesis, Tetrahedron, 39:3-22

Itakura K. et al., 1981, Chemical Synthesis And Application Of Oligonucleotides Of Mixed Sequence, Recombinant DNA, Proc 3<sup>rd</sup> Cleveland Sympos. Macromolecules, ed. AG Walton, Amsterdam: Elsevier, pp. 273-289

Itakura K. et al., 1984, Synthesis And Use Of Synthetic Oligonucleotides, Annu. Rev. Biochem., 53:323-356

Itakura K. et al., 1984, Expression In Escherichia coli Of A Chemically Synthesized Gene For The Hormone Somatostatin, Science, 198:1056-1063

Ike Y. et al., 1983, Solid Phase Synthesis Of Polynucleotides. VIII. Synthesis Of Mixed Oligodeoxyribonucleotides By The Phosphotriester Solid Phase Method, Nucleic Acid Res., 11:477-488

Scott J.K. et al., 1990, Searching For Peptide Ligands With An Epitope Library, Science, 249:386-390

Roberts B.L. et al., 1992, Directed Evolution Of A Protein: Selection Of Potent Neutrophil Elastase Inhibitors Displayed On M13 Fusion Phage, Proc. Natl. Acad. Sci., 89:2429-2433

Devlin J.J. et al., 1990, Random Peptide Libraries: A Source Of Specific Protein Binding Molecules, Science, 249:404-406

Cwirla S.E. et al., 1990, Peptides On Phage: A Vast Library Of Peptides For Identifying Ligands, Proc. Natl. Acad. Sci., 87:6378-6382

Adelman J.P. et al., 1983, In Vitro Deletional Mutagenesis For Bacterial Production Of The 20,000-Dalton Form Of Human Pituitary Growth Hormone, DNA, 2:183-193

Cunningham B.C. and Wells J.A., 1989, High-Resolution Epitope Mapping Of hGH-Receptor Interactions By Alanine-Scanning Mutagenesis, Science, 244:1081-1085

Crea R. et al., 1978, Chemical Synthesis Of Genes For Human Insulin, Proc. Natl. Acad. Sci. 75:5765-5769

Wells J.A. et al., 1985, Cassette Mutagenesis: An Efficient Method For Generation Of Multiple Mutations At Defined Sites, Gene, 34:315-323

Abreu-Martin, M.T. et al., 1995, Divergent Induction Of Apoptosis And IL-8 Secretion In HT-29 Cells In Response To TNF And Ligation Of Fas Ligand, J. Immunol., 155:4147-4154

Agematsu et al., 1995, CD27/CD70 Interaction Directly Drives B Cell IgG and IgM Synthesis, Eur J. Immunol., 25:2825-2829

Bodmer J.L., et al., 1997, TRAMP, A Novel Apoptosis-Mediating Receptor With Sequence Homology To Tumor Necrosis Factor Receptor 1 And Fas(APO-1/CD95), Immunity, 6:79-88

Browning J.L., et al., 1991, Lymphotoxin And An Associated 33-kDa Glycoprotein Are Expressed On The Surface Of An Activated Human T Cell Hybridoma, J. Immunol., 147:1230-1237

Browning J.L. et al., 1996, Preparation And Characterization Of Soluble Recombinant Heterotrimeric Complexes of Human Lymphotoxins alpha and beta, J. Biol. Chem., 271:8618-8626

Castro et al., 1996, Fas Modulation Of Apoptosis During Negative Selection Of Thymocytes Immunity, 5:617-627

Chen C-Y.A. and Shyu A-B., 1995, AU-Rich Elements: Characterization And Importance In mRNA Degradation, Trends In Biol. Sci. 20:465-470

Chicheportiche Y. et al., 1995, Identification In Mouse Macrophages Of A New 4Kb mRNA Present In Hematopoietic Tissues, Which Shares A Short Nucleotide Sequence With Erythropoietin mRNA, Biochem. Biophys. Res. Comm., 209:1076-1081

Chinnaiyan A.M. et al., 1996, Signal Transduction by DR3, A Death Domain-Containing Receptor Related To TNFR-1 And CD95, Science, 274:990-992

DeTogni P.D. et al., 1994, Abnormal Development Of Peripheral Lymphoid Organs In Mice Deficient In Lymphotoxin, Science, 264:703-707

DeBenedette M.A. et al., 1995, Role Of 401BB Ligand In Costimulation Of T Lymphocyte Growth And Its Upregulation On M12 B Lymphomas By cAMP, J. Exp. Med. 181:985-992

Degli-Esposti M.A. et al., 1997, Activation Of The Lymphotoxin Beta Receptor By Cross-Linking Induces Chemokine Production And Growth Arrest In A375 Melanoma Cells, J. Immunol., 158:1756-1762

Foy T.M. et al., 1996, Immune Regulation By CD40 And Its Ligand GP39, Ann. Rev. Immunol., 14:591-617

Gruss H-J et al., 1994, Pleiotropic Effects of The CD30 Ligand on CD30-expressing Cell Lines, Blood, 83:2045-2056

Gruss H-J and Dower S.K., 1995, Tumor Necrosis Factor Ligand Superfamily: Involvement In The Pathology Of Malignant Lymphomas, Blood, 85:3378-3404

Kitson J. et al., 1996, A Death-Domain-Containing Receptor That Mediates Apoptosis, Nature, 384:372-375

Pitti R.M. et al., 1996, Induction Of Apoptosis By Apo-2 Ligand, A New Member Of The Tumor Necrosis Factor Cytokine Family, J. Biol. Chem., 271:12687-12690



SmithC.A. et al., 1994, The TNF Receptor Superfamily Of Cellular And Viral Proteins: Activation, Costimulation, And Death, Cell, 76:959-962

Stüber E. and Strober W., 1996, The T Cell-B Cell Interaction Via OX40-OX40L Is Necessary For The T Cell-Dependent Humoral Immune Response, J. Exp. Med., 183:979-989

A copy of the aforementioned references, which are listed on the accompanying Form PTO-1449 (submitted in duplicate), are enclosed herewith.

Applicant requests that these references be

(1) fully considered by the Patent and Trademark Office

during the examination of this application; and (2) printed

on any patent which may issue on this application.

Applicant also requests that a copy of Form PTO-1449, as

considered and initialed by the Examiner, be returned with

the next communication.

An early and favorable action is respectfully requested.

Respectfully submitted,

Correspondence is being postal Service as First Addressed to: ASSISTANT PARENTS:

MASHINGTON, D.C. 20231 on

James F. Haley, Jr (Reg. No. 27,794)

Attorney for Applicants

Jonathan M. Kaplan (Reg. No. P-46,819)

Agent for Applicants

c/o FISH & NEAVE

1251 Avenue of the Americas New York, New York 10020

Tel.: (212) 596-9000